



US005857836A

United States Patent [19]**Stickler et al.****[11] Patent Number: 5,857,836****[45] Date of Patent: *Jan. 12, 1999****[54] EVAPORATIVELY COOLED ROTOR FOR A GAS TURBINE ENGINE****[75] Inventors:** David B. Stickler, Carlisle; Jack L. Kerrebrock, Lincoln, both of Mass.**[73] Assignee:** Aerodyne Research, Inc., Billerica, Mass.

[*] Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

[21] Appl. No.: 711,817**[22] Filed: Sep. 10, 1996****[51] Int. Cl.⁶ B63H 1/14****[52] U.S. Cl. 416/96 R; 416/968****[58] Field of Search 415/114; 416/96 R, 416/96 A; 60/39.75****[56] References Cited****U.S. PATENT DOCUMENTS**

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Primary Examiner—Thomas E. Denion
Attorney, Agent, or Firm—Cesari and McKenna, LLP

[57] ABSTRACT

An evaporatively cooled rotor for a gas turbine engine. Each rotor defines an internal cavity which includes a vaporization section that corresponds generally to the blade section of the rotor and a condensing section that corresponds generally to the hub section of the rotor. A radial array of circumferentially disposed capture shelves is provided in the vaporization section for capturing cooling fluid contained within the internal cavity and flowing radially outward under the centrifugal field generated during rotation of the rotor. A barrier disposed along the inner surface of the rotor wall in the condensing section slows or temporarily stops the flow of cooling fluid prior to reaching the vaporization section and a perforated baffle attached to the capture shelves prevents cooling fluid from splashing out of the shelves.

28 Claims, 10 Drawing Sheets